

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
Tank Programs Division
Corrective Action Section

NATURAL ATTENUATION DOCUMENTATION

Natural attenuation is the reduction in mass or concentration of a chemical of concern (COC) over time or distance from the release point due to naturally occurring physical, chemical, and biological processes, such as: biodegradation, dispersion, dilution, sorption, and volatilization. Natural attenuation occurs to some degree for any petroleum contaminant at any site as a result of these processes. Although natural attenuation occurs universally, it is not an appropriate method of addressing contaminant reduction at all sites.

To be eligible for LUST case closure in accordance with Arizona Administrative Code (A.A.C.) R18-12-263.04, or the Monitored Natural Attenuation (MNA) Program in accordance with A.A.C. R18-12-903; natural attenuation of the groundwater contamination needs to be documented. The following information is the minimum information that may document that natural attenuation is occurring:

- groundwater plume is adequately characterized,
- adequate period of watertable elevation information that reflects historic and current hydrologic conditions (elevations and flow direction),
- adequate period of groundwater sampling that reflects historic changes and trends in COC concentrations,
- groundwater samples analyzed for all appropriate COCs,
- groundwater analytical results that indicate COC concentrations over time are decreasing or at least stable,
- groundwater analytical results that indicate COC concentrations distance from release point are decreasing or at least stable,
- determination that decreasing COC concentrations are due to natural attenuation and not due to watertable fluctuations.

Additional natural attenuation documentation may be needed based on site specific conditions. For more information on natural attenuation please see the following references:

American Petroleum Institute, 1998, Evaluation of Sampling and Analytical Methods for Measuring Indicators of Intrinsic Bioremediation, API Soil and Groundwater Research Bulletin, No. 5.

American Society for Testing and Materials, ASTM Standard E 1943, Guide for Remediation of Ground Water by Natural Attenuation at Petroleum Release Sites.

U.S. Environmental Protection Agency, 1999, Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action and Underground Storage Tank Sites, OSWER Directive 9200.4-17P.